U.S. Army
Rapid Equipping Force

Expeditionary Lab Industry Day
3 MARCH 2015
This brief is UNCLASSIFIED.

Security

Please remember, security is everyone's responsibility.
Report any possible elicitation or suspicious activity to:
Ms. Shannon Vasquez, 703-704-3116 or shannon.s.vasquez.ctr@mail.mil

Though this is an unclassified, informational session, both Fort Belvoir and the 300 Compound have strict security protocols that must be followed by all visitors and employees.

300 Compound Security Protocols

- All visitors are required to check in at the Gelini Gate Visitor's Center where they will receive a badge. The badge will allow them through the security check point.
- Wear your visitor badges at all times above your waist.
- Personal electronic devices containing wireless capabilities are prohibited inside all REF buildings. Please leave items such as iPads, cell phones, cameras, blackberries, laptops, keyboards, etc. in your personal vehicle.
- Photography is prohibited.
- No classified discussions shall be exchanged. Keep all discussions at the unclassified level.
- You will be escorted at all times, so please do not wonder offsite.
- Access to the REF 361-T building is restricted unless cleared and approved by Security.

ALL LOST BADGES MUST BE REPORTED TO SECURITY IMMEDIATELY

The visitor control office is located in
the compound building 340.
Visitor Control Ctr. Phone number is (703) 704-2452

WELCOME
LTC Kenneth O'Donnell

REF Mission

Equip – Insert – Assess

Mission: The Rapid Equipping Force (REF) harnesses current and emerging technologies to provide immediate solutions to the urgent challenges of U.S. Army forces **deployed globally**.

Equip operational forces with solutions in order to reduce operational capability shortfalls, increase Soldier safety and reduce risk.

Containerized Weapons System (CWS)
Requirement: 10 Liner
Capability: Allows Soldiers to operate and engage in fire from a protected position. The CWS observes, detects, and engages targets with increased accuracy and reduced collateral damage and is used for integrated base defense and force protection.
Equipped: AUG 2011 – Ongoing

Insert future force technologies, threshold capabilities and/or surrogates into operational forces to speed development and validate concepts in an operational environment.

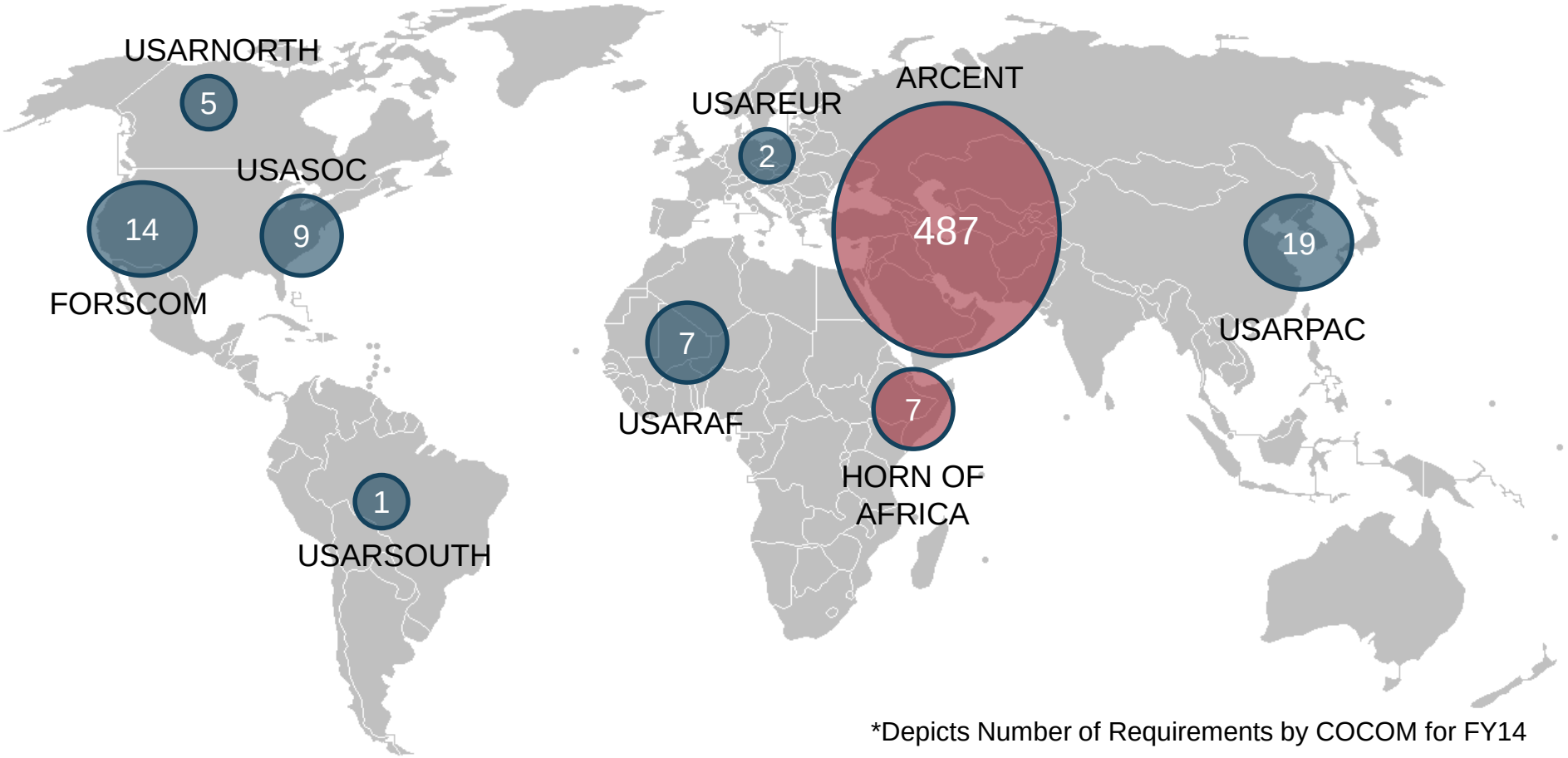
Tactical Aerostats
Requirement: Director's Initiative
Capability: Tactical aerostat platforms designed for small squad employment
Equipped: July 2010 – Ongoing
Insert effort that evolved into an equip and, ultimately, a harvest effort.

Assess the full range of desired capabilities and Army business practices to refine, modify and streamline actions and provide Army senior leaders with recommendations.

Soldier Load Assessment
Activity dates: 2008
Assessment: REF supported the multi-agency Soldier load study, which evaluated weapons, ammo, armor, protection items and other kit to provide recommendations concerning Soldier Load.
Partners: AWG, PEO-Soldier, ATEC, USAIC, ARCIC
Quickly tested and conducted operational assessments to evaluate several products for potential fielding

Global Support to the Warfighter

Equip – Insert – Assess



*Depicts Number of Requirements by COCOM for FY14

Priority Regions: Iraq, Afghanistan, Horn of Africa

As funding allows, REF equips units deployed to every COCOM.

Expeditionary Lab

Equip – Insert – Assess

ExLab 3

Co-locate Scientists with Soldiers in the fight to solve complex problems and provide rapid technologies that fill capability gaps the unit is experiencing on the battlefield.

Agenda

Equip – Insert – Assess

March 3, 2015

0900 – 0915	Welcome from Leadership
0915 – 1000	Lab Overview & Acquisition Discussion
1000 – 1100	Tour of Ex Lab 3
1100 – 1200	RFI Review / Q&A w/ REF panel
1200 – 1300	Lunch (on own)
1330 – 1330	Additional Q & A
1330 – 1600	Private Meetings

****Please reserve all questions related to the RFI for the Review / Q&A**

LAB OVERVIEW & PATH FORWARD

Ms. Joy Bonham

Lab Purpose

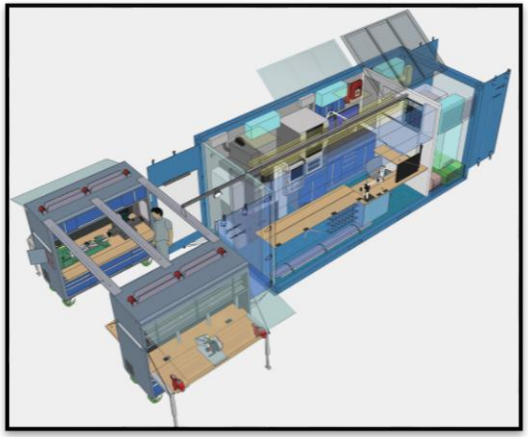
Equip – Insert – Assess

Objective

Co-locate Scientists with Soldiers in the fight to solve complex problems and provide rapid technologies that fill capability gaps the unit is experiencing on the battlefield.

Operational Impact

The expeditionary lab and its personnel can be deployed on short notice to provide Soldiers with technical assistance and rapid prototyping realization, while designed to be relatively low load for Operational Commanders.



REF Lab Timeline

Equip – Insert – Assess

OEF

OIF

Original OEF Mission (pre-REF)

KAF Lab

Well-cam

ARC

Wearable Antennas

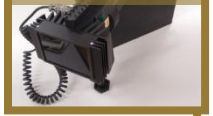
Horizon

BAF Lab

Salerno Lab

UHF-VHF Retrans

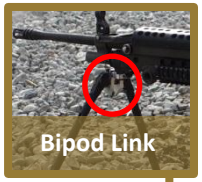
Turret IR



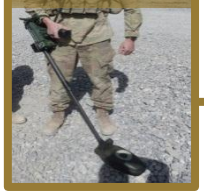
DROPcam

Nightwatch

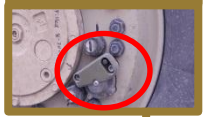
Bipod Link



Powerhound



Valve Stem Cover



ExLab 1

ExLab 2

ExLab 3

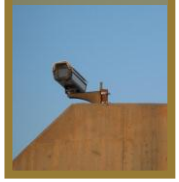
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

Start

Baghdad Lab

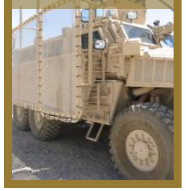
MARCbot

RDISS



Wire Mitigation

Forcefield



Packbots

LRAS3 PSU

Lapeer

PVAP

Duracrete

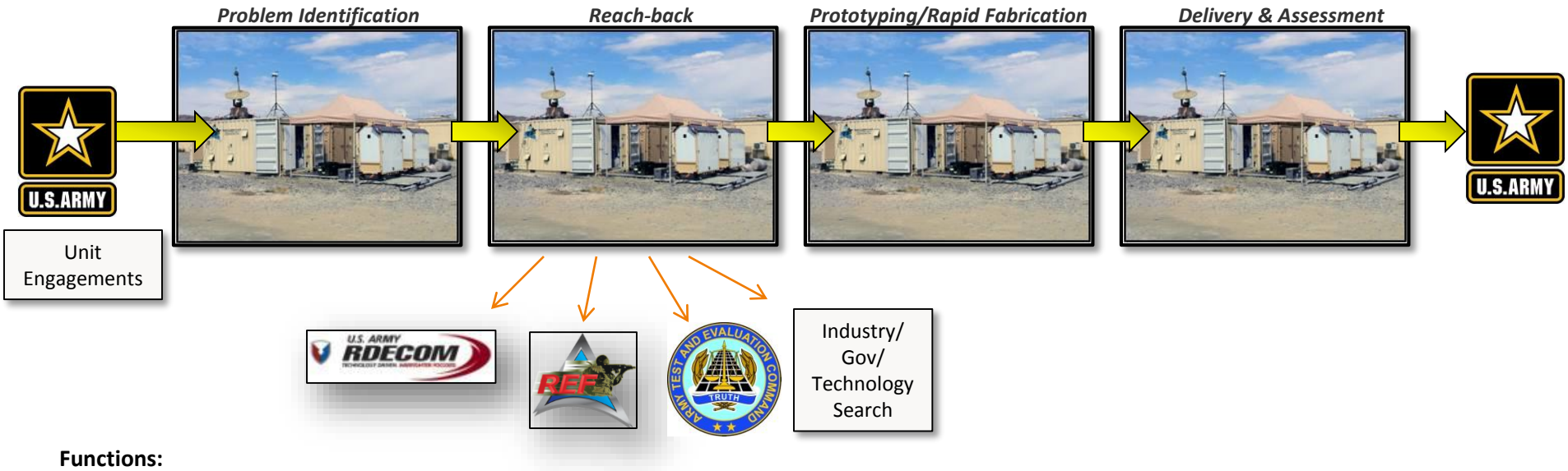
2014:
Closed KAF & BAF Lab, and ExLab 1

2015-2016:
ExLab 4

Expeditionary Lab

Equip – Insert – Assess

Mission: Enhance mission effectiveness of U.S. Army units operating in expeditionary environments by empowering Soldier-led innovative solutions that can be prototyped and, when applicable, manufactured at the point of execution.



Functions:

- Provide two Engineers, one machinist and one Noncommissioned officer to support unit request and reach back support
- Rapidly prototype and engineer solutions to the urgent operational needs of forward-deployed soldiers at the point of execution
- Accompany units to observe tactical requirements firsthand
- Custom solutions tailored to Soldiers' needs based on their direct input
- Provide material solutions to the unit from available REF "harvest" items

Soldier Led Solutions

Equip – Insert – Assess

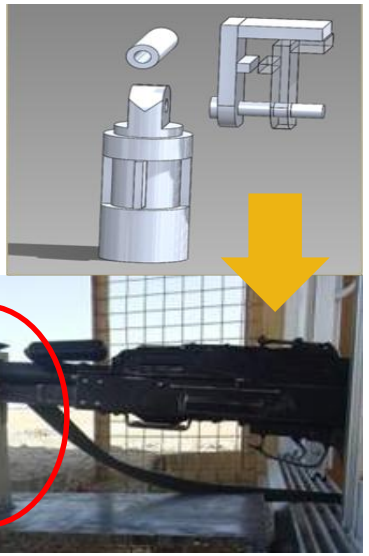
Valve Stem Cover

Identify Problem

Design Prototype

Light Mount

Refine Prototype



Pintle Locking Mount

Manufacture

M249 Bipod

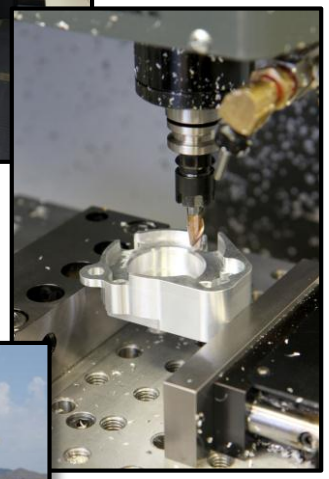
Equip

End-user Feedback

Current ExLab Capabilities

Equip – Insert – Assess

- Worldwide Communications
  - Reach-back support through satellite link (VSAT)
- Computer Numerical Control Machining
  - Fabrication of complex, highly detailed parts in plastics, aluminum, etc…
- Rapid Prototyping – 3D Printing
  - Fused Deposition Modeling (FDM)
- Fabrication
  - Portable hand tools, Plasma Cutter, Wire-fed Welder, etc…
- Microscopy
  - High-grade digital microscope
- Electronic Fabrication and Repair
  - Full range of soldering, de-soldering and electronic tools
- Data Processing and Numerical Simulation
  - Rack mount graphical workstation
- Software
  - Solidworks, GibbsCAM, Altium, Matlab, Labview, etc…
- Electronic Measurement and Instrumentation
  - Full range of computer controlled virtual instruments; multimeter, etc…



Path Forward

Equip – Insert – Assess

Build ExLab 4 to provide U.S. Army units in austere regions a rapid fabrication and prototyping Laboratory that is:

- Modular: having containers that can be connected or combined in different ways
  - i.e. using power from one package to power another package or piece of equipment like the welder
- Scalable: ability to expand or contract capabilities as operational missions require
  - i.e. bring in package one and build to package three as requested by the unit
- Tailorable: ability to cross load equipment
  - i.e. remove the welder from package two and insert into package one for a specific mission
- UH-60L Black Hawk helicopter sling loadable
- Self sustaining: having power, living quarters, and little burden on receiving unit
  - i.e. able to use all equipment with own power source

Request for Information Closure

- 10 March 2015

Request for Proposal Release

- Anticipated April 2015
- Statement of Work format, Firm Fixed Price Contract
- Contract Award o/a September 2015

ExLab 4 Build & Deployment

- Anticipated 2016

EXLAB TOUR
MAJ Ramon Salas
9:45 – 11:00

REQUEST FOR INFORMATION

Q&A

11:00 – 12:00

**All questions and answers will be captured and posted to the REF website

Lab Lessons Learned

Equip – Insert – Assess

Challenges with the build of each lab have been addressed with each iteration, however the REF is still seeking feedback and innovative ideas for continuous improvement.

Transportability, ability to cross load for different missions	Current lab requires a specific forklift to move the container on and off a flatbed truck and weight exceeds amount CH-47 will sling load. Should an AO not have the required MHE, the lab is restricted and not truly expeditionary.
More work space, ability to set up robust lab capabilities outdoors, guarded from the weather	A fully staffed lab requires one NCOIC, Two Engineers, and one Technician (4 pax) as well as Soldiers approaching the lab work working side by side conveying the capability gap. Outdoor space is highly desired, as well as collaboration space for Soldier and Lab pax interaction.
Ability to access cables, wiring, panels on machines, etc…for maintenance and repairs	Maintenance, repairs, and training need to occur on all machines in the lab, thus requiring accessibility to integrated components. Ideal set up is the ability to remove and replace large machinery with ease as well as diagnose bad wiring and cables ran throughout each container.
Appropriate power draw and usage for lab capabilities	The right amount of power for the right amount of machines will reduce wet stacking generators, excess weight and repairs, and overall damage to equipment.
Leveling and ease of equipment removal from the lab	The weight and wheels on the removable carts are challenging on non flat, hard surfaces. Also the position of the lab, once placed on the ground, tend to settle in wet conditions, making cart removal and doors being opened difficult.

Anything else?

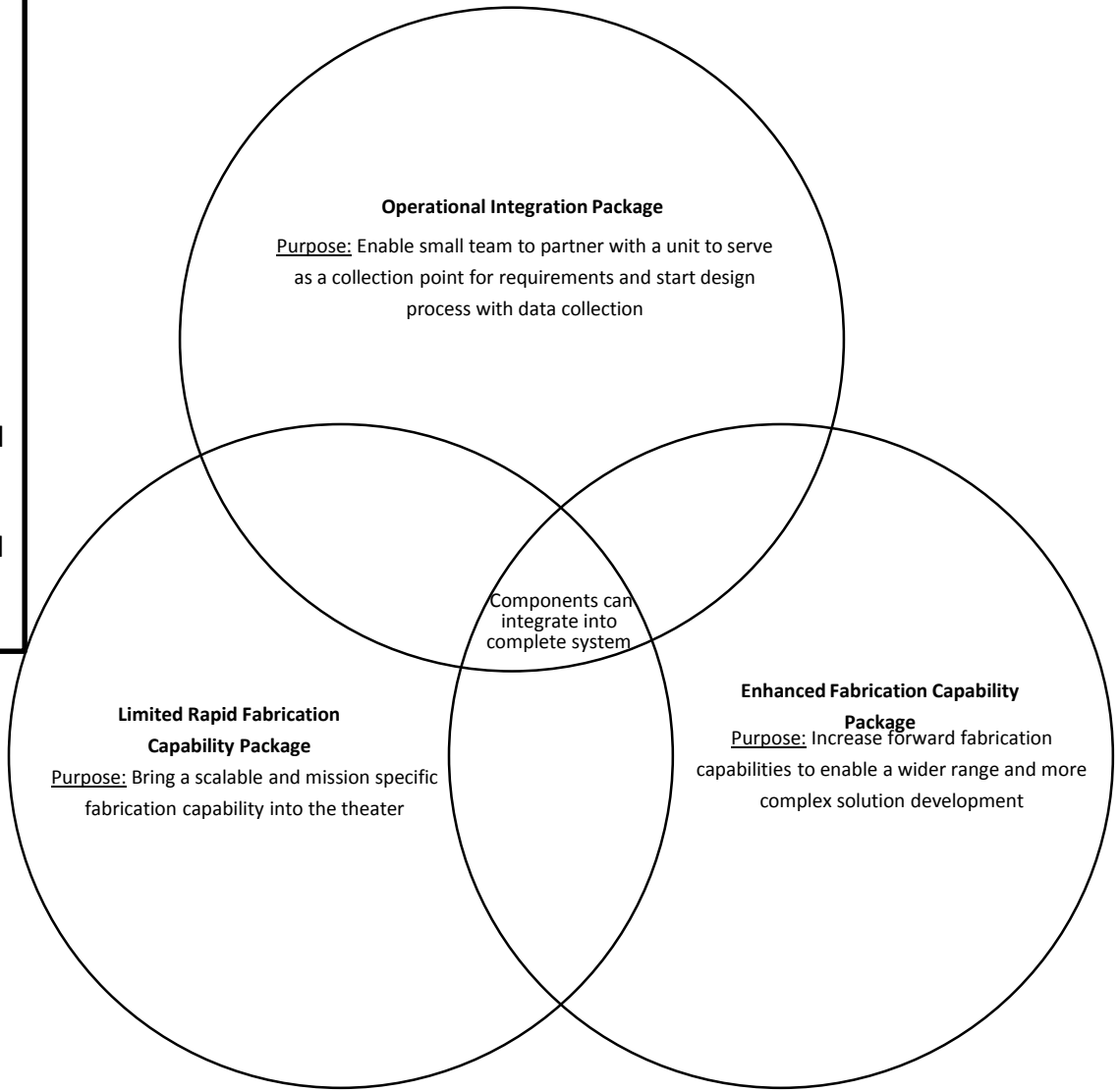
ExLab 4 Concept

Equip – Insert – Assess

Mission:
ExLab 4 enhances mission effectiveness of U.S. Army units operating in expeditionary OCO environments by empowering Soldier-led innovative solutions that can be prototyped and, when applicable, manufactured at the point of execution.

Key Tasks:
1) Each package shall stand alone or integrate with deployed units to identify requirements and serve as a link to REF
2) Execute rapid prototyping and fabrication of solutions to Warfighter requirements

Containers sized to be UH 60 transportable. Container can be whatever works. Contents can be mixed to provide mixture of capabilities



LUNCH
12:00 – 1:00

ADDITIONAL Q&A
1:00 – 1:30

**All questions and answers will be captured and posted to the REF website

INDUSTRY BRIEFINGS
1:30 – 4:00
(as required)